

COMPLETE ENGINEERING INFORMATION

CERAMICS AND GLASS

ENGINEERED MATERIALS HANDBOOK, VOLUME 4

THE LARGEST, MOST COMPLETE COLLECTION OF ENGINEERING INFORMATION
ASSEMBLED ON THIS SUBJECT...

Includes MAJOR SECTIONS ON EVERY ASPECT of this important technology:

- PRODUCTION AND SYNTHESIS OF CERAMIC POWDERS
- FORMING AND SINTERING PROCESSES
- FINAL SHAPING (MACHINING) TECHNIQUES
- GLASS PROCESSING METHODS - FROM MELTING TO STRENGTHENING (ANNEALING AND TEMPERING) OF THE FINAL PRODUCT
- TESTING
- CHARACTERIZATION AND NON-DESTRUCTIVE EVALUATION
- FAILURE ANALYSIS AND FRACTOGRAPHY
- DESIGN CONSIDERATION FOR ADVANCED CERAMICS
- ENGINEERING PROPERTIES, INCLUDING CRYSTALLOGRAPHIC AND THERMODYNAMIC CHARACTERISTICS
- APPLICATIONS AND EXPERIENCE

Ceramics touch our lives in many ways as pottery, china, cement, construction brick, window glass—and in some also unusual ways: Bioceramics are used for artificial teeth and bone implants. Optical fibers are now in the mainstream for telecommunications. Ceramic magnets are used in portable radios and televisions. Automobiles use ceramics insulators on spark plugs. Hair dryers rely on ceramic capacitors. Even computers use ceramic substrates as chip carriers. Diamonds, also a ceramic, are used as cutting and grinding material.

Ceramics also have a special property character, writes Samuel J. Schneider, Jr., of the National Institute of Standards and Technology, that requires their use in almost every production line from steel manufacture to textile making and energy production.

Ceramics and Glass emphasizes the technical side of these important materials, Schneider, volume chairman, writes. Intended to be used by engineering technologists, whether they have ceramics training or are uninitiated in the field, this book is the collective effort of hundreds of technical specialists. It brings together a wealth of information from worldwide sources to help scientists, engineers and technicians to solve current and long-range problems. Its authors include those from industry, government and academia.

This volume describes what materials classes are, their purpose and how products made from these materials are used — properties that are important in the engineering, production and application of ceramics and glass.

Ceramics and Glass treats ceramics and glass as two different technologies, primarily because of different applications, product forms and processing methods. It explains the difference between crystalline ceramics and non-crystalline ceramics. This includes descriptions of traditional or conventional applications and advanced of high technology product lines.

Within the divisional overlay of ceramics and glass and traditional versus advanced, this handbook takes readers through the steps necessary to design, produce and use ceramics and glasses. The first section introduces ceramics as diverse and technologies with many applications. Following sections address the processing stages employed in their production—from powders to product. These areas are followed by sections on design, testing and property characterization. The book's final section describes specific applications.

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